1) Joe travels from A to B at 5 mph. What speed must he travel on the return trip to average 4 mph?

$D = rt$

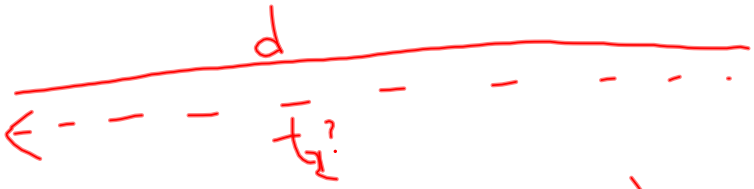
$5 = 5t \quad t = 1$

$10 = 4t \quad t = 2.5$

-1

$5 = r\,1.5$

$\frac{5}{1.5} = \frac{1.5}{1.5} \quad r = \frac{5}{1.5}$ or $\frac{10}{3}$



$\frac{d}{t_1} = 5$

$d = 5t_1$

$\frac{2d}{t_1 + t_2} = 4$

$2d = 4(t_1 + t_2)$

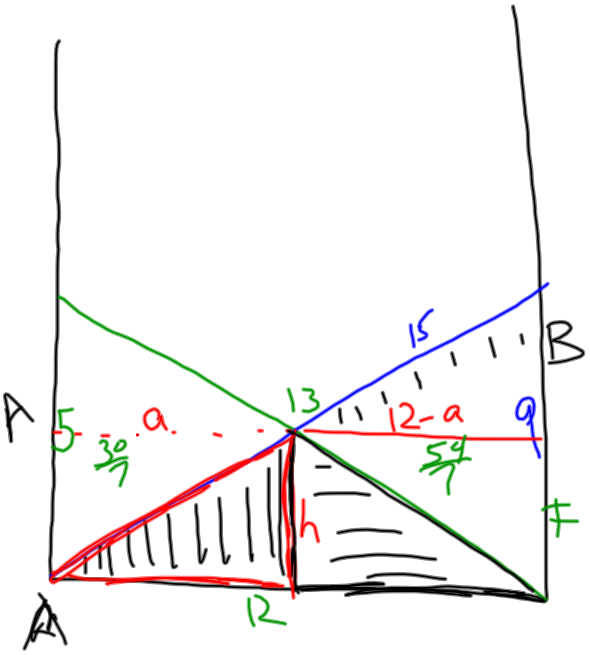
$2(5t_1) = 4t_1 + 4t_2$

$6t_1 = 4t_2$

$\frac{3}{2}t_1 = t_2$

$r = \frac{(5t_1)}{\frac{3}{2}t_1} = \frac{10}{3}$ ..

2) wall A ∥ wall B. A 13 ft ladder extends from the base of B to a point on A 5 ft up. A 15 ft ladder extends from A's base to a pt x ft up on B. What is the height of the pt where both ladders meet?



* $\frac{9}{h} = \frac{12}{a}$

and

$\frac{5}{12} = \frac{h}{12-a}$

* $12h = 9\left(\frac{30}{7}\right)$

$h = \frac{9}{12}\left(\frac{30}{7}\right)$

$= \frac{3}{4}\left(\frac{30}{7}\right)$

$= \frac{3}{2} \cdot \frac{15}{7} = \frac{45}{14}$

* $9a = 12h$

$9a = 60 - 5a$

$a = \frac{60}{14} = \frac{30}{7}$

* $5(12-a) = 12h$

$60 - 5a = 12h$

5) simplify $\sqrt{6+4\sqrt{2}} - \sqrt{2}$.

$\sqrt{6+4\sqrt{2}} - \sqrt{2} = s$

$\left(\sqrt{6+4\sqrt{2}}\right)^2 = (s+\sqrt{2})^2$

$6+4\sqrt{2} = s^2+2s\sqrt{2}+2$

$s^2+2=6$ and $4\sqrt{2}=2s\sqrt{2}$

$2=s$

$((4-2s)\sqrt{2})^2 = (s^2-4)^2$

$(16-16s+4s^2)(2) = s^4-8s^2+16$

$32-32s+8s^2 = s^4-8s^2+16$

$0 = s^4-16s^2+32s-16$

± 1
± 2
± 4
± 8
± 16

s^4-8s^2+16 / $(s^2-4)^2$

$= s^4-8s^2+16 - 8s^2-32+32s$

$= (s^2-4)^2 - 8[s^2-4s+4]$

$= (s^2-4)^2 - 8[s-2]^2$

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1) D=RT 2) similar △s 5) let answer = s

5.3/62

$y = \frac{1}{(x-a)(x-b)}$

horizontal asymptote

$\lim_{x\to+\infty} \frac{1}{(x-a)(x-b)} = 0$

$y=0$ is a h.a.

vertical asymptote

$\lim_{x\to c} \frac{1}{(x-a)(x-b)} = +\infty \text{ or } -\infty$ DNE $(+\infty, -\infty)$

$x=a, x=b$ are vertical asymptotes

zeros

no zeros

$y = \frac{1}{(x-a)(x-b)} = \frac{1}{x-a}\cdot\frac{1}{x-b}$

$y' = -(x-a)^{-2}(x-b)^{-1} + (x-a)^{-1}(-(x-b)^{-2})$ $\quad -(x-a)^{-1}\cdot(x-b)^{-1}$

$= -\left[\frac{1}{(x-b)(x-a)^2} + \frac{1}{(x-a)(x-b)^2}\right] = -\frac{(x-b)+(x-a)}{(x-a)^2(x-b)^2}$

$y' = \frac{a+b-2x}{(x-a)^2(x-b)^2}$

crit #s

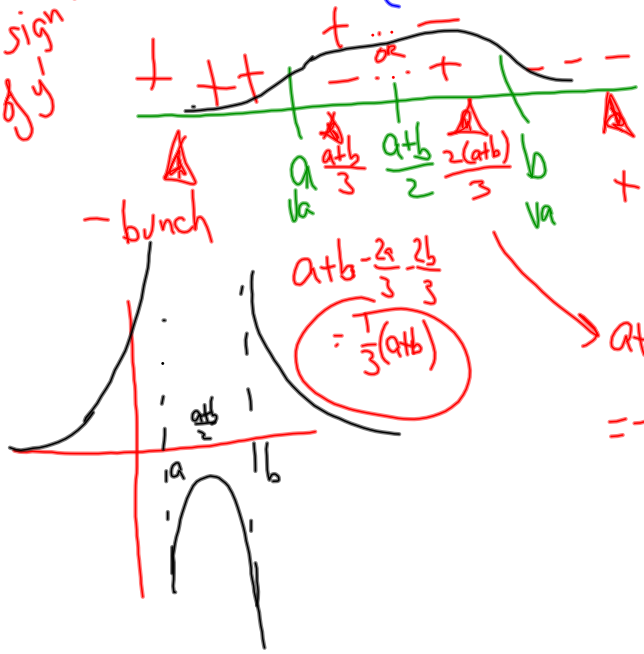
f' Und: $x=a, x=b$

$f'=0$ $\quad a+b-2x=0$

$x = \frac{a+b}{2}$

assuming $a<b$

sign chart of y'



$a+b-\frac{2a}{3}-\frac{2b}{3} = \frac{1}{3}(a+b)$

$a+b-\frac{4}{3}a-\frac{4}{3}b$

$= -\frac{1}{3}(a+b)$